

APPENDIX A

POTENTIAL COMPONENTS
OF A MORE EFFECTIVE
OIL POLLUTION CONTROL PROGRAM
FOR THE
STATE OF TEXAS

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INTRODUCTION

Texas, a state with a long history of living in harmony with the oil industry, has suffered an incredibly bad year with regard to oil pollution of its bays, estuaries, ship channels, beaches and coastal waters. The reasons for this influx of oil spills have ranged from acts of God such as lightning striking the SEA TIGER and CHEVRON HAWAII, inadequate technology, as in the case of the IXTOC I, and seamanship problems ranging from the collision of the BURMAH AGATE, the collision of the AMOCO CREMONA with a mooring dolphin and the reported overrun of its own anchor by the ESSO BAYWAY.

There are, however, two common factors which make the likelihood of the repeat of these accidents a real probability. First, the majority of these spills involve foreign oil shipped to Texas to replace our dwindling domestic supply. This is a phenomena of only the last few years but could continue. Secondly, the exploration and production of oil in deeper areas of the sea where problems cannot be solved as quickly or easily.

Perhaps these problems could be tolerated if an adequate response mechanism was in place. Unfortunately, none have been perfect and some have been downright pitiful, allowing hundreds of miles of Texas beaches to be fouled with oil, large areas of our coastal plain were covered with floating slicks and considerable oil was deposited in the subtidal zone near our coast. In addition, many of the decisions being made are not using the experience and capability of Texas scientists and engineers or extensive Texas data bases, nor adequately considering the wishes of Texas state agencies. All resources of Texas agencies and industry have not been utilized. As a result it appears that the time has arrived for Texas to develop a program to assure that effective responses are generated to oil spills which impact on the beaches and subtidal

resources it holds in trust for its citizens.

In this document the author reviews a number of lessons learned from selected spills in Texas in the recent past which he has studied in depth.

A program is then proposed for Texas which he believes can capably use the governmental, industry and academic resources in Texas.

RECENT SPILL EXPERIENCES IN TEXAS AND ELSEWHERE AND THEIR LESSONS

A. The IXTOC I: The IXTOC I was the first of the two really major spills that exposed the deficiencies in the existing oil pollution control response mechanism as it exists for Texas. The IXTOC I resulted in approximately 10,000 tons of oil being deposited on the Texas coast in August and September 1979. The spill response was carried out under the auspices of the National Contingency Plan with funding from the National Oil Spill Contingency Fund, inasmuch as the United States was concerned, the spill fell either into the category of mystery spill or one where the spiller refused to accept responsibility for the spill. In the opinion of the author the response left much to be desired.

1. The input to the decision process by Texas agencies and academic community was minimal and particularly the wishes of some State agencies were given little regard in the federally dominated response.

2. No predeveloped plans for the booming of the estuary entrances had been published and, indeed, are not believed to have existed prior to the spill. In spite of the 75-day lead time, no such plans were documented and published, and oil did appear at two of three most southern Texas estuaries before any booms were in place whatsoever.

As an example the Oil Spill Technical Assistance Team of

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Texas A&M University, in conjunction with the Brownsville Navigation District had gone into a field a month before the oil hit the Brazos Santiago Pass and carried out an extensive background study including current measurements and potential boom deployments in the Brazos Santiago Pass. Although they advised the current Federal on-scene commander that they were in the field carrying out these studies, and had hand carried the study results to the science support coordinator and discussed preliminary results in person with the on-scene strike force commander, the recommendations were not followed nor were the reasons for choosing an alternate plan presented. Indeed, the person in charge of the response in the Brazos Santiago Pass had not even been made aware of the study or provided a copy of it.

3. Our bay and estuary entrances were protected more by the pelletized nature of the weathered mousse and the normal current characteristics at the end of the jetties which tend to divert sand and thus other particles around the entrance to the estuaries than by protective booming. This was fortunate because all but one boom deployment in the Brazos Santiago and Mansfield cut areas were placed in current regimes where they could not possibly hold oil against the prevailing currents during a normal tidal cycle. The exception was one boom which would hold under prevailing currents but would fail under nominal wind conditions from the east, the prevailing wind direction.

4. Since large inventories of booming materials were not available in Texas, and thus had to be acquired from Navy or contractor resources adequate booming equipment was late in coming and inadequate in terms of quantity.

5. There was a failure to use industry resources other than the excellent but quite limited capacity of a few oil spill cleanup contractors. In developing plans to deal with the IXTOC I little or no use was made of the extensive resources available throughout the industrial community of Texas.

As the home of the oil industry in The United States, extensive engineering and managerial talent for use on the major oil spills exists in the State and large inventories of equipment are maintained under the auspices of the Clean Gulf Cooperative and its member companies throughout the Gulf Coast region, with the heaviest emphasis in Louisiana. At the time of the IXTOC I spill some 56,000 feet of oil spill control boom was owned and stockpiled by these entities.

6. The most unacceptable component of the response from the viewpoint of the author was the slow rate of removal from the beaches in front of the resort hotels and the failure to remove materials from other beaches. Based on a gross miscalculation of the stability of our barrier island system and of the efficiency of equipment for removing oil effectively from the beaches, decisions were made which allowed oil to remain on the beaches. This decision resulted in the oil becoming further mixed with sand, a major part of it being deposited in the subtidal zone immediately in front of the beaches at the fragile edge of the ocean and other quantities moving elsewhere in the environment, either to other beaches or into the bays and estuaries. Although a reversal in this policy was achieved, by the concerted effort of State agency personnel, the U. S. Fish and Wildlife Service and other groups working through the science support coordinator, the delay in getting the policy reversed led to the oil being so buried on the beaches or deposited in the subtidal zone that further recovery was impossible.

7. The leaving of the oil on the beaches in such large volumes established a dangerous precedent in that others who spill oil off the Texas coast could argue for non-cleanup of their oil on the beaches based on the example of the IXTOC I. This came to pass following the collision of the BURMAH AGATE.

8. Relatively little concern was shown on the federal level except by local Congressmen for the plight of the

individuals who incurred economic damages as a result of this spill. Indeed, there appeared to be those who felt these people should willingly accept economic loss to enhance the negotiations for Mexico's energy. Specific remedial legislation in Congress is being held hostage by those who hope to use the IXTOC I spill to force the passage of the larger and more comprehensive "Superfund" bill.

B. The BURMAH AGATE: The BURMAH AGATE oil spill began with the collision of the freighter MIMOSA and the BURMAH AGATE at the Galveston Bay entrance channel some six or seven miles offshore at Galveston on November 1, 1979. The key issues in this spill were:

1. The failure of the U. S. Coast Guard to adequately monitor the movement of the oil along the coast;

2. A repeat demonstration that contingency plans did not exist for the booming of the bay entrances in the event of such a spill and indeed until impact occurred on the coastline without any defensive measures being in place whatsoever;

3. The spill was the exact situation for which the Coast Guard had developed their offshore containment and removal equipment package over the past nine years, and although the Coast Guard was supposed to be able to respond rapidly to a tanker accident which was spilling oil, the response in this case was exceptionally slow. An initial Coast Guard skimming barrier was not put into operation until four days after the spill, and it failed. Skimming operations using a second barrier and two Navy Marco skimmers did not initiate until eleven days after the spill, and their recovery rates were very disappointing. The Navy's Lockheed skimmer was not yet in use sixteen days after the spill. The excellent weather existing in the Galveston area during much of this period and the fact that in most cases the oil came from the ship in a narrow cohesive stream particularly demonstrates that this

federally owned, offshore containment equipment is no major defense from pollution from an offshore spill.

4. Failure to use industrial resources can again be cited. Again, for various reasons, the substantial offshore pollution control capability of the oil industry on the Gulf Coast was not utilized in dealing with this spill. The Clean Gulf Cooperative has several skimming devices including a fast response skimmer and a large "Hoss" skimming system which were available for use during this spill but were not.

Fortunately, as the spill progressed, some estuarine defenses were developed and deployed to cover further releases from the ship. The failure for fast response to this spill may be partially attributed to the organizational framework under the Federal Water Pollution Control Act which permits the responsible party to handle its own cleanup. The question arises, however, when the person responsible is not able to physically carry out a fast response and the governmental agencies have the capability to do so, whether the government should not proceed immediately to deal with the problem until such time as the industry is able to do so. The assumption of liability and cleanup costs by the BURMAH AGATE and their insurance company is applauded; however, it is believed their interests would have best been served if an organization were available to deal with the problem immediately until help, arranged for by these parties, could have arrived, rather than allowing the oil to flow freely into the environment.

C. The ESSO BAYWAY: The ESSO BAYWAY spill occurred in the Neches ship channel on January 29, 1979. The spill is believed to have resulted from the ESSO BAYWAY overrunning its own anchor in this shallow waterway, when it tried to make an emergency stop to avoid a sinking barge at the Sun Oil docks. The ESSO BAYWAY spill is notable because the company involved in the spill had been carrying out an extensive worldwide marine casualty response program planning activity and as a

result, a capable management and contracting team worked together to deal with the spill. The favorable north winds during the spill period enabled the oil to be contained in a relatively small area and the ultimate cleanup was successful. However, southerly winds could have carried the oil into the large marshlands area of the Bessie Heights canal and Grays bayou. The spill exposed the following weaknesses:

1. The lack of an effective oil spill cooperative organization among the industries of the Neches estuary;
2. The lack of an effective oil spill contingency plan for the Neches estuary area;
3. The lack of specific site-specific planning for such areas as estuary entrances on the channel which included plans to close these estuaries and the equipment and personnel available to expedite their closure at the time of the spill.

D. The HEARNE PIPELINE BREAK: The HEARNE PIPELINE BREAK occurred near the community of Hearne north of College Station in early June of 1977. It is mentioned to show that not all of our pollution problems are confined to the coastal zone. In this case a pipeline ruptured and spilled over a thousand of barrels of oil which ran into local creeks. An initial quick response by company personnel in the local area, was effective in containing the oil. Unfortunately, a skilled oil cleanup contractor was not quickly called in to remove the oil and the removal rate by contracted vacuum trucks was slow and ineffective. During the period of the spill removal a major thunderstorm occurred in the drainage basin of one of the creeks causing the creek to rise and currents to increase in excess of entrainment velocities on the booms. As a result, the majority of the oil was swept under the booms, down the Little Brazos River and the Brazos River into the Gulf of Mexico. During the time of the spill personnel from EPA who are in charge of spills in inland areas and the Texas Railroad Commission visited the site but did not stay in constant

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contact with the cleanup operations. Three major lessons were learned from this spill:

1. Continuous monitoring of the spill response effectiveness is needed;

2. On-scene personnel need to be advised of effective resources to deal with the spill and the potential problems of not using them;

3. The necessity of cleaning the banks of an additional fifty miles of the Little Brazos River (as a result of losing the oil) was a much higher cost than that of bringing in a contractor with effective skimming devices early in the spill.

E. The METULA: The oil spill from the supertanker METULA provided many lessons to those throughout the world who cared to look and consider them. Since no cleanup was attempted, this spill has become a major scientific experiment on what happens when a spill is left to nature. It generally shows that in high energy areas the oil erodes away rather quickly and goes into the marine environment. In sheltered areas, such as protected beaches, supratidal areas and marshlands, the oil can remain for extended periods of time if substantial oiling has occurred. This spill showed us that the already large volume of oil spilled was magnified by the emulsification of approximately two to three parts of water into each unit of oil.

The task of moving this mass of emulsified oil is a public works job of significant proportions. It was this observation that led to the designation of the Texas Department of Highways and Public Transportation as an action agency during the time of the spill since they are an entity which has the manpower and equipment to deal with such a task.

The METULA spill occurred in a very remote area where access and the use of equipment would have been very difficult. It also reminded us that we have such systems in Texas in that access to many of our barrier island systems is limited and

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that getting equipment to such islands and oily materials from such islands is a problem which must be dealt with effectively in our contingency planning program.

F. The AMOCO CADIZ: Until the IXTOC spill, the AMOCO CADIZ spill of 223,000 tons of oil on the Brittany coast of France was the world's largest oil spill. It also brought forth many interesting lessons, only a few of which will be discussed here.

1. The lesson it again demonstrated was that the major defense for a major spill will be made on the coastline.

2. It again demonstrated that the volume of material to be handled can be increased considerably by the emulsification of the oil and the contamination of sand, seaweed and detritus.

3. The overall effort and cost of cleanup were increased dramatically by failure to act swiftly.

4. There was a failure to have effective site specific contingency plans for the protection of the estuaries and for quick marshalling of forces to remove the oil when it is most amenable to removal.

5. There is a need for an effective overall contingency plan for both the federal administrative level and a local site-specific level.

6. It is also necessary to have a hierarchy of response organizations running from local capability to deal with small spills to major public works and military resources to deal with large spills.

Following the AMOCO CADIZ, the Republic of France has initiated a program which requires its national public works agency, the Department of Equipment, to carry out extensive local site-specific contingency planning. The author has observed some of these local site-specific contingency plans which deal with each beach, each harbor and each estuary of the coasts. These include detailed plans of boom deployment,

boom requirements, the construction of boom anchorages, beach access, oiled material disposal areas, etc.

SUMMARY

The spills discussed in detail above are but a few from which major lessons can be learned. Detailed reports have been written by the Oil Spill Technical Assistance Team at Texas A&M University on most of the above mentioned spills, but the team is prepared to provide additional information on spills elsewhere which also demonstrate these and other points.

SUMMARY OF SHORTCOMINGS OF THE EXISTING SYSTEM IN TEXAS

The author has viewed the spills discussed above and has tried to develop a summary list of what he considers to be the shortcomings of the existing system, as it relates to Texas.

1. In the absence of an aggressive State program, the system is federally dominated. As a result, decisions are possible, as on the IXTOC I, which are not in the best interest of Texas, e.g. international energy politics with Mexico or the failure to move quickly and effectively with regard to the spill taking place from the BURMAH AGATE.

2. There has been a demonstrated shortcoming in the federal organizational response capability, i.e. the federal response carried out in Texas to date has depended entirely or almost entirely on contractor resources and the limited capability provided by the U. S. Coast Guard and U. S. Navy.

3. There is lack of site-specific local contingency planning. In spite of the charge in the 1970 Federal Water Pollution Act that local contingency planning should be carried out, it generally has not been done in Texas (with the exception of the Corpus Christi area with its local spill control association). As a result when a spill like the BURMAH AGATE occurs off our coast, there is no detailed plan readily available

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which shows how to boom certain estuaries or to demonstrate the priority of protection for the different environmental systems.

4. There is a need for preconstructed boom and anchorages in estuary entrances, ferry landings on inaccessible islands for emergency access, preconstructed diversion areas in which to deflect oil, storage facilities, etc, in order to make rapid responses and to be able to respond effectively in remote areas.

5. There is a lack of response capability based in Texas. In spite of the heavy level of marine and oil related commerce and the evolving oil production offshore, the amount of oil pollution control equipment based in Texas is quite limited. The main industrial equipment inventory is maintained in Louisiana, the main contractors working on the Gulf Coast have their headquarters in Louisiana and the limited federal response capability of the Gulf Strike Team is based in Mississippi. Similarly, the Navy capability is based on the east and west coasts of The United States and not in Texas.

6. There is a failure to use existing industrial capability and management in dealing with oil spill response. The carrying out of a major oil pollution response such as to the IXTOC or even a smaller spill, requires the establishment of a response organization with skilled and knowledgeable people in the key areas. On a spill that lasts for an extended period of time, a reserve of such people is necessary so that those involved can cycle back to their old duties and other responsibilities. There exists in the industrial community in Texas either current or potential capability for staffing such response organizations. Indeed, many individuals have been used to staff responses within their companies either in Texas or elsewhere in the world.

7. The federal response in this area is dictated by the Regional Response Team, which has representatives from many federal agencies but only one seat for the State of Texas.

Indeed, the State agency that is represented must have many of its programs approved by the federal government and much of its budget comes from the federal government making the taking of a strong position at cross purposes with the federal administrators very difficult unless backed by a strong state policy group.

Aspects of the Federal Water Pollution Control Act calling for either the subcontracting of certain activities to the State and the repayment of certain State costs incurred at the time of spill makes it possible for a state to take a much more aggressive role if it chooses to do so. A model program exists in the State of Maine.

8. The failure of the U. S. Coast Guard to succeed in making a rapid response to the BURMAH AGATE or other spills indicates that a more rapid response capability needs to be established in Texas.

9. The failure of the U. S. Coast Guard and Navy equipment at sea to attain a meaningful reduction of the pollution level leaving a stricken ship indicates that the State should develop alternate response measures as well as be prepared to deal with the oil on the coast.

10. There has been a substantial use of non-Texas scientists as part of the federal science support program in Texas while at the same time ignoring the years of experience existing in Texas agencies and institutions. The use of such scientists has led to decisions which are at cross purposes to the wishes of Texas agencies and to the beliefs of many specialists in Texas who deal routinely with oil related issues.

11. Failure to establish either policy or decision rationale for cleanup methods, disposal methods, chemicals, sand replenishment, etc., which need be decided before (not during) the spill.

STATE OF TEXAS
ALTERNATIVES

Texas is believed to have three alternatives it can pursue with regard to oil pollution control in Texas.

1. Texas can accept the current standard of performance and continue to let the federal government deal with oil spills with only token State participation.

2. Texas can aggressively seek improvements in the federal response structure but with still only token Texas participation.

3. Texas can embark upon a joint state-industry program whereby it is able to establish its own policies for the clean-up of its coastlines and to utilize the management, academic personnel and equipment resources of the local and State government and industry resources to develop the model State program for the protection of its environmental resources.

WHY A GREATER
ROLE FOR TEXAS

It is believed that State action is needed or warranted to achieve a more effective oil spill response in Texas for the following reasons:

1. The State is allowed to assume greater responsibilities and to be repaid for response expenses under the Clean Water Act and the National Contingency Plan.

2. Reasonable local government cleanup costs and third party damages can be reimbursed under international insurance programs.

3. The need for effective site specific contingency plans for Texas bays and estuaries.

4. The need to prepare access to some barrier islands, boom and anchorages, diversion areas and storage areas.

5. The need to stimulate fast efficient response to minimize impact.

6. The need for a reservoir of response equipment in Texas.

7. The need for a trained corps of men for rapid response and

supervision.

8. The need to have State policy pre-established regarding what areas are to be protected, where and how to clean, what to use, where to put residue, sand replacement, etc.

9. The need to provide for use of State resources to supplement individual and contractor resources and vice versa.

10. The State superport may require direct State response and industry assistance and,

11. There is a need to carry out tests of response methods for use on Texas environmental systems.

GREATER STATE ROLES BEING ASSUMED ELSEWHERE

The idea of a greater State role in oil pollution control is not new. A very successful program is being carried out in Maine and the program is being copied to various degrees in New Hampshire, New York and New Jersey.

The Maine program is an entirely state program funded by a State Contingency Fund acquired from a .03¢ per barrel tax on crude oil and products. The fund is currently being raised from \$6,000,000 to \$10,000,000 with strong industry support.

The program is administered by Mr. Marc Guerin and is staffed with a group of State spill response supervisors. The program role is to either oversee a spiller's cleanup or to step in and clean up the spill if necessary.

The program fund is partially regenerated through response charges paid by spillers.

In Maine the U. S. Coast Guard role shifts from that of complete responsibility to that of being a resource to be called in by the State. The U. S. Coast Guard Division in Boston is reported to be quite pleased with the arrangement.

Although the Maine program is somewhat different from the one suggested for Texas, there are many aspects of the program which are similar. A visit to Maine to explore this

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program in depth might be valuable for those planning a new program.

ORGANIZATIONAL COMPONENTS
OF A PLAN TO
PROTECT TEXAS

It is suggested that Texas intensively investigate the formation of development of an integrated oil spill response framework for the State of Texas. The key elements of such a plan would be:

1. A stronger State role in policy development using state agency, academic and industrial talent.
2. A stronger State role at the spill time utilizing such techniques as a State Advisory Committee, a State Science Support Team, and a strong State On-Scene Commander and Science Support Co-ordinator. These groups could execute and promote State policies on speed of response, resources to be utilized, methods to be utilized, and results to be achieved.
3. A stronger response mechanism within the State of Texas. These could include the creation (or stimulation) of oil spill co-operatives utilizing state, industrial and federal participation patterned along the lines of the highly successful Corpus Christi Area Spill Control Association. This response mechanism could include State participation in providing the resources and management and staffing for such a response, the establishment of a hierarchy of response using contract, state agency, and industrial personnel, and the development of industry-state agreements prior to spills with regard to the use of State resources on industry spills and ultimately, industry resources on State spills if the State support comes into being.

4. An appropriate financing mechanism to share the burden of cost for the response mechanism and the scientific support could be established utilizing a variety of State and industrial funding mechanisms.

5. The preparation of appropriate legislation to enable the program to provide for State participation in the program, to construct needed State facilities and to provide a source of emergency operational funds until repayment is received from the spiller or the Federal Contingency Fund.

OIL SPILL CONTROL COOPERATIVES DEVELOPMENT IN TEXAS

Throughout The United States there have been developed over 100 oil spill cooperatives. Many have been very effective. They have established a strong equipment and supply resources for dealing with spills. Some provide emergency manpower from a group of government or industrial sources and some carry out intensive response drills and training sessions to prepare to deal with spills. A few are nothing but loose mutual aid societies that have little effect.

The idea of effective oil spill cooperative structure has not developed on the Texas coast. Most existing cooperatives such as those on the Neches Estuary, Houston Ship Channel, Texas City, Freeport area and the Galveston-Lower Trinity areas have limited equipment resources and little or no contingency planning or collective response plan capability. The notable exception is in Corpus Christi. The Corpus Christi Spill Control Association is a unique local government-industrial partnership; each pays half the cost of equipment and for running an effective cooperative capable of dealing with the normal expected problems in that local area.

It is the example of an effective cooperative in this area which demonstrates the pathway to an effective State program to stimulate the growth of the cooperatives in the other areas and to spur through State assistance their improvement.

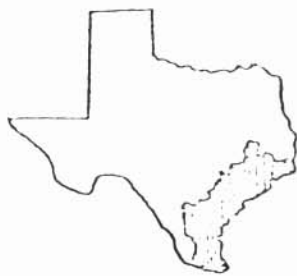
As shown in Fig. 1, it is suggested that a group of five spill control associations be established along the Texas coastline with perhaps a sixth being established in the inland portions of the State. These would consist of the Golden Triangle Spill Control Association, which would cover the Orange, Beaumont, Port Neches, Port Arthur area; the Houston-Galveston Bay Spill Control Association which covers the Houston ship channel, Bayport-Cedar Bayou industrial complex and the upper half of the Galveston Bay; the Coastal Texas Spill Control Association which would cover the Galveston, Texas City, Freeport area and associate coastline; the Corpus Christi Spill Control Association which would expand its coverage from the Rio Grande to Pass Cavallo and the Offshore Texas Spill Control Association which would expand upon the capability of the Clean Gulf Cooperative for offshore operators, but also integrate with this the capability for dealing with marine transportation accidents.

A potential line diagram showing the overall structure recommended in this section and within it these five associations, plus membership by the State in the Clean Gulf Association to gain access to its equipment reserves, is shown in Fig. 2.

It is envisioned that these organizations would be set up as living entities with a core staff to administer the program and maintain cooperative equipment resources and each would have technical support from its member companies or consultants to carry out an effective, aggressive activity of contingency planning for their project area under general guidelines provided by the State of Texas.

The specific activities envisioned for each of the cooperative entities are outlined as follows:

1. To develop both administrative and site-specific contingency planning to deal with anticipated types of accidents in their particular areas.



LOCATION MAP

10 0 10 20 30 40
SCALE IN MILES

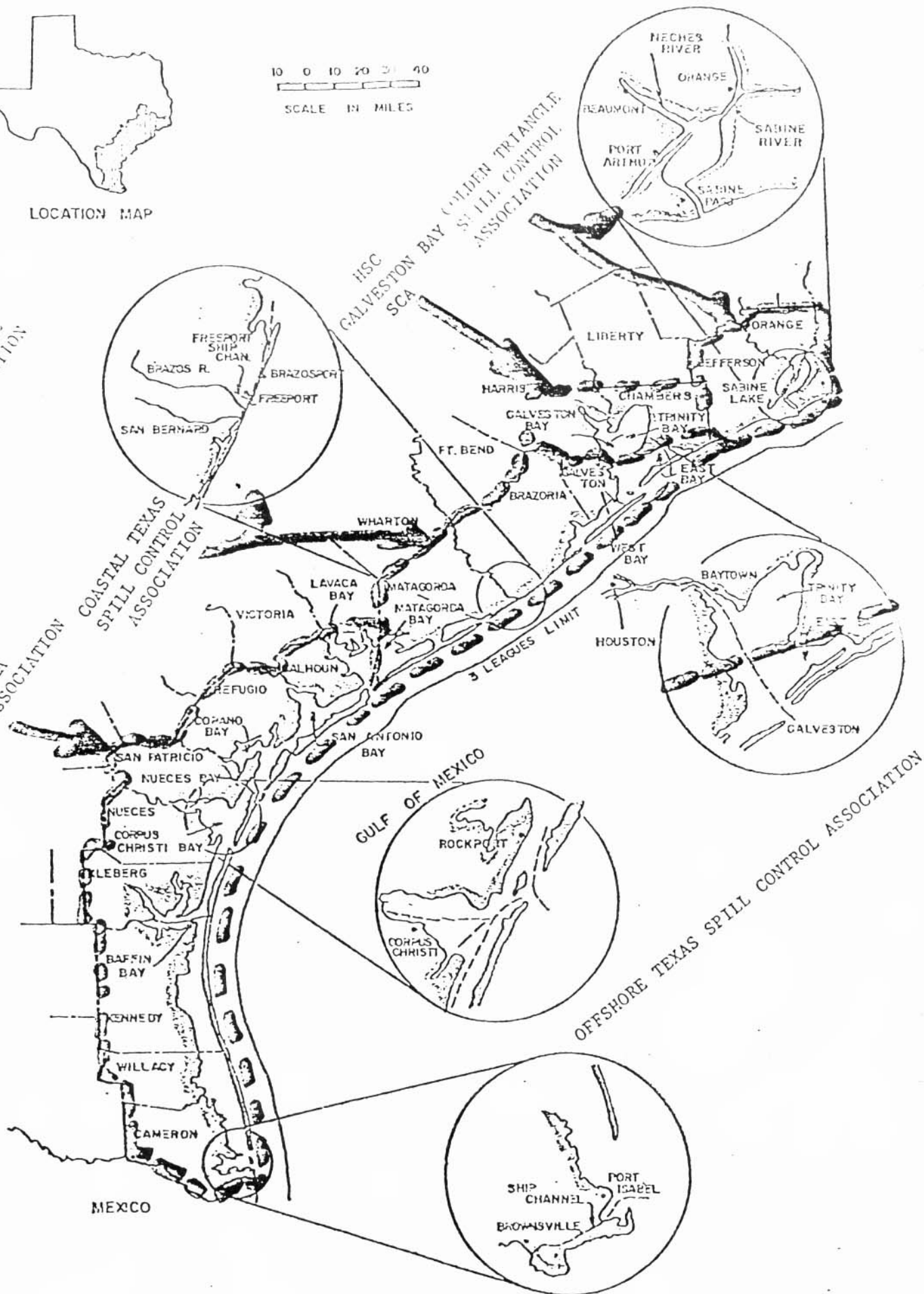
TEXAS INLAND SPILL
CONTROL ASSOCIATION

COASTAL TEXAS
SPILL CONTROL
ASSOCIATION

CORPUS CHRISTI AREA
SPILL CONTROL ASSOCIATION

HSC GALVESTON BAY
SPILL CONTROL
ASSOCIATION

OFFSHORE TEXAS SPILL CONTROL ASSOCIATION



TEXAS COASTLINE

FIGURE 1

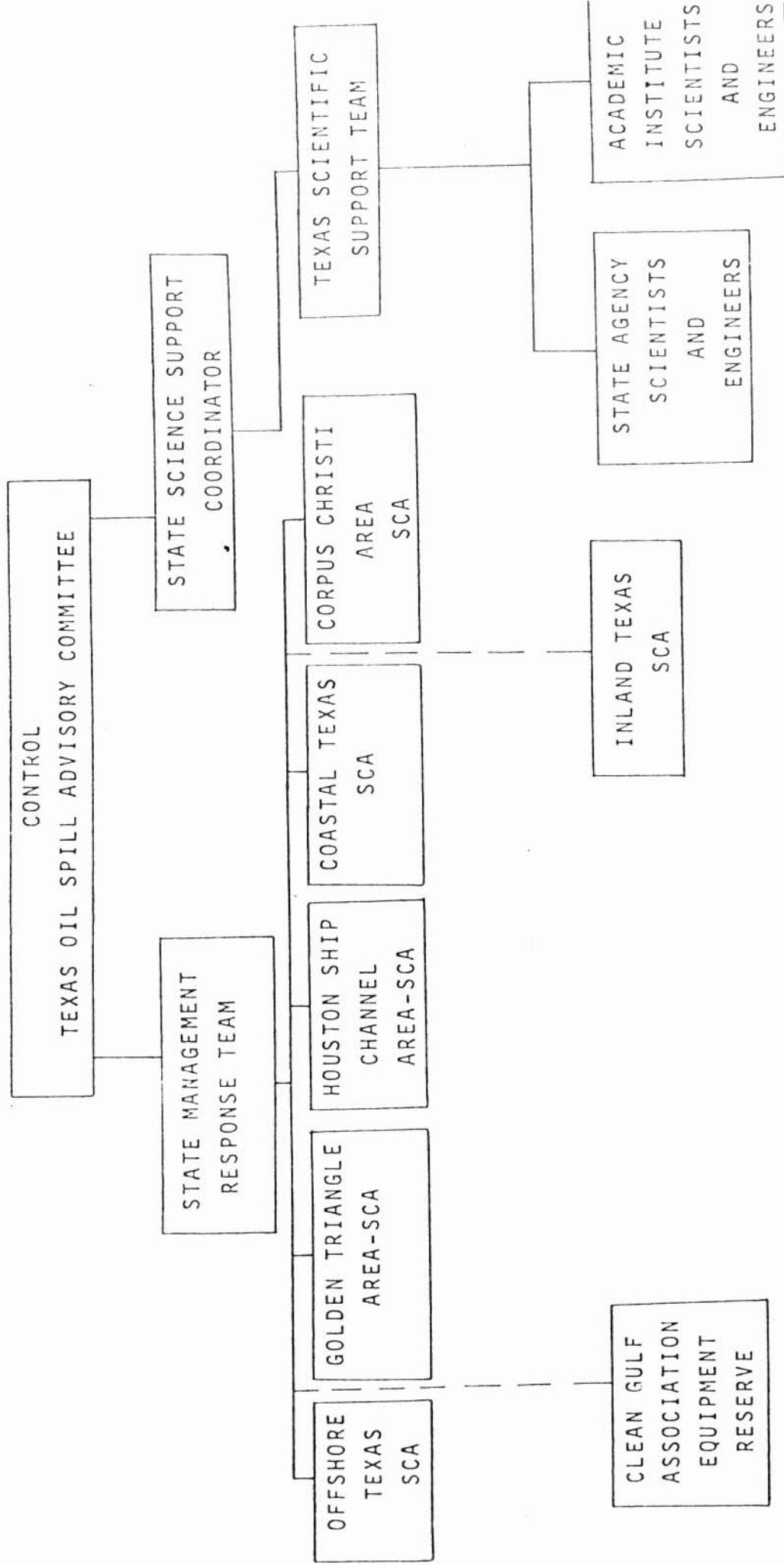


FIGURE 2
POTENTIAL OIL SPILL CONTROL ORGANIZATION FOR TEXAS

2. To construct the necessary facilities, boom anchorages, diversion areas, interim storage areas, long term disposal areas and ferry landings for use during time of spills.

3. To develop and maintain inventory of specialized supplies and equipment for use during time of spills.

4. To develop necessary pre-agreements for governmental agency, contractor and industry response covering the use of manpower, equipment and other resources and further develop agreements with other cooperatives in the State and elsewhere such as Clean Gulf to share equipment in the case of a major spill.

5. To provide an instantaneous management structure to deal with both major and minor spills.

6. To provide either response personnel or initial response personnel until replaced by contractor or spiller personnel resources.

7. To identify participants who will staff both management and operating personnel roles so they can be trained in these activities.

OIL SPILL COOPERATIVE ADVANTAGES

It is believed that the development and promotion of the Oil Spill Cooperatives by the State of Texas will generate many advantages, mainly:

1. It will call for utilization of the capability from various sources to deal with the emergency, i.e. government, industry, academia, etc.

2. It will prevent needless duplication on the part of the industries and agencies in Texas.

3. It provides for a quicker response than normally would be provided by individual spiller responders or by the U. S. Coast Guard from locations outside of Texas.

4. It provides for an in-depth reservoir of management personnel.

5. It provides the focus for the planning and training activity.

6. It develops a consistency in the response.

7. It develops a mechanism to deal with spills from mystery sources and from those unwilling or unable to deal with spills.

Financial aspects of the Cooperative Plan are presented later.

It should be remembered that by establishing oil spill cooperatives for the State of Texas this does not in itself resolve all of our oil pollution problems. Indeed, no matter where you are dealing with a spill a hierarchy of resources depending on the size of the spill and duration of the cleanup is required. This hierarchy of resources ranges from the spillers own personnel, the resources of cooperatives, the resources of contractors, the resources of specific pollution control agencies, the military and other entities. Fig. 3 shows many of the resources available for the response hierarchy.

By developing a system of cooperatives for the Texas coastline we will have available immediately company resources and cooperative resources to be able to make a rapid response to a spill. We also have available the resources of those contractors in Texas and those that we can reach here in a reasonable period of time from Louisiana and other locations. We also have the Texas Department of Public Resources which is uniquely capable of dealing with oil on beaches and of ferrying men, equipment, and materials to and from barrier islands. By the combination of all these resources a substantial capability will be developed in the State of Texas.

This overall response group will be capable of making a

CAPABILITY

Source		Oil Spill Cleanup									Technical Assistance/ Documentation					
		Organized Manpower	Oil Spill Equipment	Oil Spill Supplies	Construction Public Works Equipment	Vacuum Trucks & Tank Trucks	Vessels	Aircraft/ Helicopters	Manpower Logistics	Other	Oil Spill Specialists	Engineering Manpower	Scientific Manpower	Legal Manpower	Financial Management	Photo/ Documentation
INDUSTRY	Company Resources	x	x	x					x	x	x	x	x	x	x	x
	Cooperative Resources	x	x	x		x	x			x	x					
CONTRACTORS & SUPPLIERS	Oil Spill Contractors	x	x	x		x	x			x	x					
	Construction Contractors	x			x											
	Oil Industry Service Contr.	x			x	x	x	x	x							
	Oil Spill Suppliers		x	x												
CONSULTANTS & ACA- DEMIC ORGANIZATIONS	Oil Spill Consultants										x	x		x		
	Environmental Consultants												x			
	Universities										x					x
	Research Organizations										x	x	x			x
LOCAL/STATE GOVERNMENT	Public Works Transportation	x			x			x	x							
	Fire/Police	x														
	Port Authorities						x									
NATIONAL GOVERNMENT	Navy/Coast Guard	x	x				x	x	x		x					
	Army	x			x			x	x							
	Air Force	x						x	x							x
	Public Works	x			x				x							

Figure 3

ORGANIZATIONAL COMPONENTS OF THE RESPONSE HIERARCHY

complete response on modest sized spills and the important initial response on a major catastrophic spill. This response would include sealing off the bays and estuaries under a pre-determined plan, making initial attempts at containing the oil offshore and/or carrying out initial containment and removal activities along the beachfront to prevent oil from spreading to other areas.

If we exceed these resources with a spill of catastrophic proportions that will require an extensive and costly cleanup, it is then possible to turn to resources such as traditional contractors, the military or other sources to replace the shared cooperative resources, or those of State agencies. The people involved from these entities could then return to their primary activities.

THE ROLE OF TEXAS
DEPARTMENT OF HIGHWAYS
AND PUBLIC TRANSPORTATION

The major role anticipated for the Texas Department of Highways and Public Transportation in the 1975 Texas Oil and Hazardous Materials Law has not evolved as envisioned. This agency was chosen for this role because it has some very unique capabilities which could play a very important role in oil spill response in the State of Texas. Three important areas are:

1. Fast, mechanized cleanup of impacted beaches.
2. Providing access to otherwise inaccessible areas in the coastal zone.

3. Operating the material handling components of the plan including stockpile of replenishment sand for the beaches and management of oil material reclamation and disposal areas.

The selection of the Department of Highways and Public Transportation for these roles was made with four major factors in mind, namely:

1. The availability of skilled engineering and management staff.
2. A large labor resource.
3. A large inventory of specialized public works equipment.
4. The agency role in operating the ferry system and the intercoastal waterway in the State of Texas.

For this agency to be a truly effective entity in dealing with the spill problem however, it must be authorized funds for this purpose, it must develop a cadre of trained people in the area, and it must acquire certain specialized equipment.

This major role for the Department of Highways and Public Transportation would be expected to continue as a part of the cooperative program outlined within this document. It would be expected that the district engineer or other staff engineers in each of the cooperative areas would participate actively in the conduct of the cooperative planning programs and the Texas Department of Highways and Public Transportation organization would provide men and equipment for many of the responses. Indeed, the state contribution to the cooperative organization might best be handled through the budget of the Department of Highways and Public Transportation rather than as a direct appropriation for the purpose.

The original selection of the Department of Highways and Public Transportation came as a result of recognizing that dealing with a major oil spill is a public works job of significant proportions requiring public works related management, logistics and equipment. In the State of Texas, only the Department of Highways and Public Transportation has the critical mass to provide an immediate work force to deal with such a task.

During the past year we have also learned that we must work very quickly to remove oil from our beaches or else the material is either buried, washed into our estuaries or deposited

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into our subtidal zone. Fig. 4 indicates this concept. We have also learned that equipment such as motor graders, front-end loaders, scraper loaders and vacuum trucks, if used quickly, can minimize the amount of sand removed from the beaches. It has however, been carefully drawn to our attention that sand removed by this process on many Texas beaches should be replaced either for legal or environmental considerations. This is because many of our barrier islands are suffering sand starvation as a result of many other environmental modifications made in Texas and elsewhere.

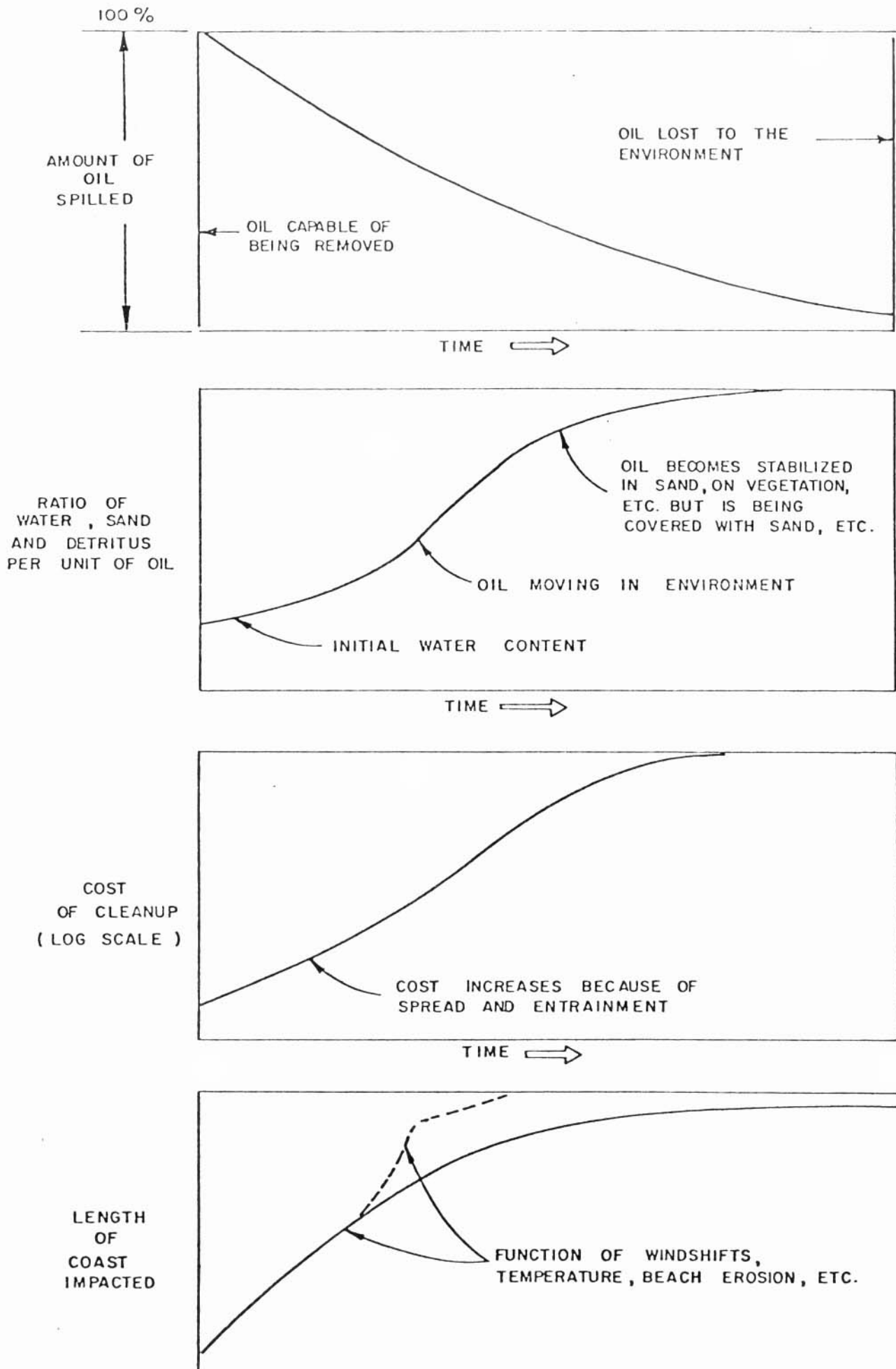
We strongly believe that this important State resource manned by fifteen thousand persons and with thousands of pieces of equipment can help make Texas a model state with regard to oil pollution control when this capability is combined with that of industry in the more traditional role of on-water containment and removal.

The use of the Texas Department of Highways and Public Transportation results in a substantial savings to the public in cleanup costs. These savings result because equipment used for most parts of the cleanup are normally used in other routine activities.

For an oil spill contractor to stockpile such routine public works equipment for only occasional use during spills would lead to substantially higher equipment charges. Similar savings result from using normal labor sources with effective Texas Department of Highways and Public Transportation supervision rather than higher priced short term labor and supervisors who would be hired for a cleanup and then laid off.

Funds accrued to the Texas Department of Highways and Public Transportation from cleanup fees would go to pay overtime charges and replacement labor to "catch up" on jobs delayed by participating in the response activity.

FIGURE 4
EFFECT OF DELAYED CLEANUP RESPONSE



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DESIGNATION OF A
STRONG STATE
RESPONSE TEAM

It would be expected that the State as a whole as well as each cooperative would establish a managerial response team. This would include specialists in a number of important areas such as:

1. Offshore response.
2. Coastal cleanup response.
3. Public information.
4. Accounting.
5. Communications
6. Documentation
7. Logistics
8. Oil Reclamation and Disposal, etc.

It would be expected that the local area team would handle any spill requiring only resources currently available within their area. On a spill which involved more than one area, or involved resources in addition to those needed for the local area, the State response team would be activated. The state response team would have similar components as well as specific Texas agency representation.

DESIGNATION OF A
STRONG STATE TECHNICAL
SUPPORT TEAM AND A STRONG
STATE SCIENCE COORDINATOR

During the major spills of the last year, NOAA, through its hazardous material response program brought a large number of scientists to the State of Texas and carried out an aggressive program of providing science support to the cleanup activity and documenting the spill activities. However, these teams have generally only had modest input from local Texas scientists and indeed, many of those scientists in Texas who had some of the greatest knowledge dealing with petroleum and its effect

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on the marine environment have not been utilized. It is believed that a much more effective science support team for the State of Texas can be established from the agencies and academic institutions in the State of Texas. All that is necessary for initiating and carrying out such a program are the financial resources to activate and support such an activity. It is emphasized that this activity is not intended as the "observer" role provided at the spill scene by many State agencies. This is intended as a strong, active group to provide to the response team detailed scientific and engineering information including that collected in the impacted area. And to carefully document the physical, chemical and biological environments which are impacted. The reader is referred to the draft program entitled, Engineering and Scientific Studies Before, During and After a Spill, and to reports developed by the Texas A&M University Oil Spill Technical Assistance Team on the ESSO BAYWAY spill as a demonstration as to what is included in this type of program.

It is also emphasized that this is to be a free-standing State-supported science team with its own science support coordinator to interface both with State and/or federal On-Scene Commanders. Thus, the State will be represented one-on-one with the federal team rather than a subservient role such as one of a large group of scientists brought in by the federal government.

ADVISORY GROUP
FROM GOVERNMENT,
INDUSTRY AND ACADEMIA

It is suggested that a group composed of government, industrial and academia personnel be organized in an advisory status to guide the state response activities, review past performances, and make recommendations for future capabilities. To some degree this team would serve the same role within the

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State of Texas as the Federal Regional Response Team; however, the majority of the members of the advisory group will be selected because of their technical competence in the oil spill control field rather than as merely the formal representatives of the specific agencies.

LEGAL FRAMEWORK
FOR AN OIL SPILL PROGRAM

It is proposed that the Oil and Hazardous Material Control Law for the State of Texas be amended to accomplish the following:

1. To develop a State program to stimulate the development of, to participate in, and deposit cleanup resources with a series of oil spill cooperatives on the Texas coast.

2. To call for and finance effective site-specific oil spill contingency planning for the entire Texas coast and major river basins.

3. To provide funding to utilize existing information and to acquire adequate new scientific information on environmental resources and physical features to permit effective contingency planning.

4. To establish the mechanism and funding for a State oil spill technical and science support coordination program to utilize Texas engineering and scientific talent and existing data available at the time of major oil spills.

5. To establish an oil pollution advisory committee to act as a parallel to the federal regional response team and recommend policy determination, and decisions on products and methods for use in Texas.

6. To establish the mechanism for State-industry mutual assistance with appropriate means of compensating for these activities.

7. To establish a program of training activities developed to train personnel from management to equipment operators to

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assure trained personnel are on hand to supervise and/or staff response efforts.

8. To establish liability on the part of the spiller for the repayment of spill cleanup costs and local administrative support costs charged directly to the State of Texas.

9. To provide the necessary regulations to permit the State supported cooperatives to take immediate action at the time of the spill in order to mitigate the damage of such spills to the State of Texas and to provide for repayment from the spiller and/or Federal Contingency Fund for such activities.

10. To expand the financial resources of the Texas Oil and Hazardous Material Fund to provide for response activities until repayment is received from the spiller and/or the Federal Contingency Fund.

11. To authorize the expenditure of State funds to provide access to remote barrier islands, boom anchorages, diversion areas, storage facilities, ferry landings and emergency ferries, etc.

12. To provide for the compensation by the spiller if known, by the State of Texas if unknown, to provide for third party damages to Texas citizens or property owners for proven economic losses incurred as a result of oil and hazardous material spills.

13. To authorize an agreement for the State of Texas to assume responsibility for response for all spills impacting the coastline or the rivers, bays and estuaries of Texas.

FINANCIAL ASPECTS OF THE PLAN

It is expected that the industrial share of from one-half to two-thirds of the cost of the response program would be borne by those industries using the waterways for either internal or foreign commerce of oil and for oil production. This type of arrangement has worked quite well with cooperative organizations elsewhere in The United States. Sometimes the cost

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is shared on a unit basis, with each carrying an equal share, but more often it is based on some measure of the shipping volume or production which indicates the likelihood of risk.

Some mechanism needs to be established to insure that spills from ships will be responded to by the cooperatives. It would be expected that ships that were owned by the companies who are regular participants in the cooperative would automatically have provisions for calling on the capability of the cooperative organization. On the other hand, a problem exists with ships like the BURMAH AGATE, which are owned by oil companies or entrepreneurs who are not based in the Texas area. It may be possible for the ports to require a trip membership in the cooperative which would be secured before entering Texas coastal waters. The trip membership would authorize the cooperative to act instantaneously when a spill occurred and for a fee, to qualify them for the lower cooperative rental rates for the equipment and manpower.

As with all major cooperatives, a charge would be made by the cooperative for the actual response. This charge will include charges for personnel drawn from a variety of resources, a rental fee for the equipment which may be different for member or non-member users, and to repay the prorata cost for core staff. Traditionally, funds generated from such purposes are used to pay for actual expenses of the cleanup and that portion thereof which covers the cost for equipment rental or the salaries of the core staff is retained and used to offset the following year's budget.

A potential for federal funding for response equipment exists through either the Coastal Impact provisions of the energy program or windfall profits tax benefits. It could also be possible to arrange for the stationing of the U. S. Coast Guard, U. S. Navy or other equipment in the Texas area.

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The cost of equipping and operating oil spill cooperatives differs markedly from place to place depending on the level of risk, the local economy and the level of environmental protection demanded by the citizens in the area.

The highly successful Clean Bay Cooperative in San Francisco Bay might compare with the larger proposed Texas Cooperatives. It has accumulated an inventory of \$2.5 million in equipment during six years of life and has an annual budget of approximately \$730,000. Of this, \$220,000 is for everyday personnel and expenses, \$275,000 for storage, equipment maintenance and repair, \$85,000 for planning, training and studies and \$100,000 capital acquisition.

The Southern California Offshore Cooperative has a budget on the order of a half million dollars per year.

Closer to home, the smaller Corpus Christi Area (SCA) has an annual budget of \$143,500 per year.

All of these budgets are core budgets with additional funds being expended for direct response expenditures. Co-op costs are usually larger in the early equipment acquisition years.

It is anticipated that the overall cost to Texas of the Cooperative Program would be a sum of the following components:

1. The State share of the Cooperative budgets for example:
2. The cost of membership in Clean Gulf
3. State construction costs for ferry landings, etc., plus
4. State administrative, training and planning costs.

No specific estimates are suggested for the appropriate State cost but it is believed that the overall cost will be very small compared to the value of the oil industry to the State of Texas and the value of the tourist, fisheries and other marine resources of the State.

Oil spills in Texas from an ocean going tanker are likely covered by the TOVALOP or CRISTAL international insurance programs which would pay not only cleanup costs but also reasonable economic damage costs up to 75 million dollars. Thus,

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those in the tourist, fisheries, offshore supply and other industries and individual properties would be compensated for their damages.

The same would be true under both the Civil Liability Conventions and International Fund Convention if The United States had ratified these conventions. Unfortunately, they have not been ratified by The United States to date.

U. S. legislation normally parallels international programs. Our main oil pollution act was the Water Quality Act of 1970 which at that time followed the international programs by providing only for oil spill cleanup cost payment. Pending "Superfund" legislation which would amend the Water Quality Act includes third party damage provisions has been bogged down for various reasons; primarily by the inclusion of hazardous materials in the bill.

Thus Texas citizens are not covered for damages from U. S. Coastal Trade barges and ships not under the TOVALOP or CRISTAL nor from spills from foreign drillings, tankers in ballast, and freighters with oil as fuel.

It would be appropriate for Texas to consider the programs established in other states such as Maine which utilize the resources of a state pollution fund to pay legitimate damages incurred to citizens and businesses economically damaged by oil spills.

SUMMARY AND CONCLUSIONS

This document serves as a brief skeleton of a potential oil pollution control plan for the State of Texas which can provide for a much more effective defense against oil pollution than has been achieved during the past year. The achievement of the program components will let Texas better control the quality of its coastal resources and assure its citizens that government and industry can work together to minimize the impact

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of the occasional instance of oil pollution associated with the Petroleum activities that are so important to the State of Texas.

There have been many different successful formats for oil pollution response in different areas of the world. The ideas collected together in this document appear to be a workable selection of known and accepted components which have worked elsewhere and which appear well suited for working in Texas. Any other selection of components which will work effectively are equally acceptable. What is important is that efforts be initiated to develop an effective defense for oil pollution in Texas.